

Notice of Allowability

Application No.

10/071,846

Examiner

Brian J. Sines

Applicant(s)

BEEBE ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the response filed 7/6/2004.
2. ☒ The allowed claim(s) is/are 1-3, 8-23, 28-40 and 44-47.
3. ☒ The drawings filed on 2/8/2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Allowable Subject Matter

Claims 1 – 3, 8 – 23, 28 – 40 and 44 – 47 are allowed.

The following is an examiner's statement of reasons for allowance:

The cited prior art neither teach or fairly suggest a microfluidic apparatus comprising a micromachined flow guiding structure and a method of operating the apparatus, wherein the method is comprising the steps of: providing a micromachined flow guiding structure having a base having a surface and a cover with a surface facing the base surface, the cover surface spaced from the base surface, adjacent facing regions on the base surface and cover surface defining a flow path from a source position to a destination position on the base and cover surfaces, a region on at least one of the base and cover surfaces formed as a flow guiding stripe wettable by and having a wetting angle of less than 90° with respect to a first liquid, and a region adjacent to the guiding stripe being nonwetable and having a wetting angle of greater than 90° with respect to the selected liquid; injecting the selected liquid onto the flow guiding stripe; and injecting a second liquid onto the regions adjacent to the guiding stripes and in contact with the first liquid, the second liquid being immiscible with the first liquid and nonwetable with respect to the guiding stripes.

The cited prior art neither teach or fairly suggest the further incorporation within the claimed apparatus at least one side channel having a bottom wall and two side walls, the cover extending over the at least one side channel and having a surface spaced from and facing the bottom wall of the side channel, the at least one side channel intersecting the main channel, a flow guiding stripe formed on the bottom wall of the side channel and an adjacent facing flow

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guiding stripe formed on the cover surface that are wettable by the selected liquid, and a region on the bottom wall of the side channel and on the facing cover surface adjacent to the flow guiding stripes in the side channel being nonwettable by the selected liquid, the flow guiding stripes in the side channel intersecting and joining the flow guiding stripes in the main channel.


The cited prior art neither teach or fairly suggest a method of forming a microfluidic flow guiding structure, the method comprising the steps of: forming a channel in a base and a cover, the channel having a bottom wall and two vertical sidewalls in the base and a surface of the cover spaced from and facing the bottom wall, the height of the channel between the bottom wall and the facing cover surface being $1,000\ \mu\text{m}$ or less; injecting into the channel at least two parallel streams of liquid and flowing them together in the channel in adjacent laminar flow in contact with the bottom wall and the cover surface, one of the liquids being a solvent which does not affect the surface of the bottom wall of the channel and the cover surface and the other of the liquids being material that deposits a self-assembled monolayer onto the surface of the bottom wall of the channel and the cover surface over which the stream of liquid passes, the material of the bottom wall of the channel and of the cover surface being wettable by a selected liquid and the self-assembled monolayer deposited on the surfaces being nonwettable by the selected liquid.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian J. Sines, Ph.D. whose telephone number is (571) 272-1263. The examiner can normally be reached on Monday - Friday (11:30 AM - 8 PM EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill A. Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jill Warden
Supervisory Patent Examiner
Technology Center 1700